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# A Statewide Preventive Health Care Program for the Aged

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## Synopsis. ....

*Because of the rising percentage of elderly in the population and the cost of health care expenditures, interest has increased in preventive health care services for the aging. Although the effectiveness of such programs is still being discussed by policy makers, the number of preventive health programs for the elderly is increasing. One of the oldest and largest preventive health programs for the elderly in the United States, the California*

*Preventive Health Care for the Aging Program (PHCAP) is analyzed.*

*The typical PHCAP participant was white, female, between 70 and 79 years of age, and living in an urban area. More than half (59 percent) of the PHCAP participants had some kind of private medical insurance in addition to Medicare coverage. Seventy-seven percent of the participants had seen a physician within the previous year. The most frequently reported chronic conditions were arthritis (31 percent), hypertension (24 percent), cardiovascular problems (13 percent), and vision and hearing problems (18 and 11 percent). Twenty-seven percent of the population were hypertensive; 7 percent of these had moderate to severe hypertension. Eighty percent of the participants were identified as having at least one problem; 40 percent were referred to a physician.*

*Frequently, public health programs need to be evaluated without the benefit of a controlled trial design. This analysis of a statewide preventive health care program for the aging, PHCAP, shows the program's effectiveness in detecting a large number of health problems and making extensive referrals to other health professionals, particularly physicians. These findings should be useful to health practitioners and policy makers developing similar statewide programs for the elderly.*

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**T**HERE ARE MORE ELDERLY people in our society today than ever before, and the cost of providing health care to them is an increasing concern. However, there is evidence that some of this cost can be delayed or avoided through comprehensive health screening programs. From a cost-benefit perspective, a healthier and more industrious older population would result in sizable reductions in medical and hospital expenses, welfare costs, and social security payments, while at the same time contributing to an increased gross national product and standard of living (1,2). Studies have documented a substantial range of potential contributions achieved by preventive health programs targeted toward older Americans (3-5). Accordingly, many preventive health programs for older Americans have been developed and implemented in the past 10 years. One of the oldest and largest health

screening programs is the California Preventive Health Care for the Aging Program (PHCAP).

Based on the approach of the Well Child Clinics (Maternal and Child Health Programs) initiated under Title V of the Social Security Act, the California legislature established PHCAP in 1973 with the goals of health promotion and the prevention, delay, and control of prevalent disease conditions among older adults. PHCAP is administered by the California State Department of Health Services which assists local health programs in providing preventive health services to older adults. Aimed at helping the elderly maintain their health and independence, the local programs include early detection of chronic diseases, general health assessment, counseling in the management of chronic ailments, and referral for care. In fiscal year 1985-86, PHCAP provided preventive health ser-

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## Areas Assessed by Nurses in the California Preventive Health Care for the Aging Program

<b>Demographic/social</b>	Gastrointestinal
Date of birth	Blood pressure
Sex	Cardiovascular
Ethnic group	Musculoskeletal
Marital status	Skin
Living arrangements	Respiratory
Medical insurance coverage	Genitourinary and gynecologic
<b>Self-reported chronic diseases</b>	<b>Laboratory testing</b>
Arthritis	Urinalysis
Cardiovascular, stroke	HGB/HCT
Cardiovascular, other	Blood sugar
Diabetes	<b>Health counseling</b>
Hypertension	Weight control
Respiratory	Immunizations
Vision	Medications
Hearing	Smoking
<b>Dietary indices</b>	Alcohol use
Congregate meals per week	Nutrition
Food recall or frequency:	Exercise
Milk products	Psychosocial:
Animal protein	Stress
Vegetable protein	Emotional
Leafy greens	Mental health
Salt intake	Breast examinations
<b>Blood pressure readings</b>	Medical supervision
Systolic	<b>Results of any referrals</b>
Diastolic	Reason for referral
<b>Disability</b>	Type of referral:
Hospitalizations in past year	Physicians
Bed days in past month	Other professionals
<b>Organ systems assessed</b>	Outcome of referral:
Vision	New diagnosis
Hearing	New treatment plan
Oral, dental	

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The methodological problems involved in such a study have been previously described (8).

## Methods

At PHCAP's 24 local screening sites, participants (who are all self-referred) can obtain a physical assessment from a registered public health nurse who has specialized training in gerontological nursing. The participant may also receive basic laboratory tests. Specimens are sent to local hospital laboratories for analysis. For each participant's visit, the nurse completes an encounter form that covers the areas assessed. The major components of the assessment are shown in the box.

Health screening by PHCAP nurses involved examining 10 different areas for possible health problems. Vision examinations included glaucoma and vision acuity tests. Hearing tests were performed by PHCAP staff using standard screening techniques (for example, audiometer, tuning fork). Dental-oral examinations included an inspection of gums, tongue, palate, mucosa, teeth, and dental prostheses. Blood pressure was taken in a seated position. If the first reading was abnormal (systolic greater than 159 mm Hg or diastolic greater than 89 mm Hg), then two more readings were taken. The average of the last two readings was used to classify a person as hypertensive. The remaining six areas of health screening (cardiovascular, musculoskeletal, skin, gastrointestinal, genitourinary-gynecological, and respiratory) usually involved asking about previous conditions and symptoms rather than a physical examination, except for the skin and musculoskeletal system.

A series of laboratory tests were performed on participants' urine and blood samples. A urine sample from a clean-catch mid-stream specimen was tested for the abnormal presence of glucose, protein, bacteria, blood, or ketones. Blood samples were tested for blood sugar, hemoglobin, or hematocrit (HGB/HCT). A random post-prandial blood sugar was obtained using blood glucose strips or an electric colorimeter. Blood sugar and HGB/HCT problems were defined using standards established by the California State Department of Health Services (6).

PHCAP health counseling covered such areas as weight control, nutrition, smoking, and immunizations. Participants were usually assessed for possible psychosocial problems, which included stress and emotional and mental health items from the encounter form. The next most common health counseling area was weight control. As perceived

vices for participants in 26 cities in California. The State's fiscal and program year is July 1 through June 30. During this period, PHCAP records showed more than 45,000 total contacts representing more than 17,000 different participants. The cost of the program averaged \$150 per participant per year.

The purpose of our study was to analyze the California PHCAP and its participants to provide data to policy makers on the program's effectiveness. Areas analyzed include major demographic characteristics, health status, medical care use, and PHCAP health promotion activities. When possible, the data are compared with State data such as California Census Reports (6) and national data, such as the National Health Interview Survey (7).

Table 1. Major characteristics of participants in the California Preventive Health Care for the Aging Program, by sex and age group, 1985-86 sample (percentage distribution)

Characteristics	Total (N = 5,454)	Sex		X <sup>2</sup>	P value	Age group (years)			X <sup>2</sup>	P value
		Men (N = 1,859)	Women (N = 3,595)			60-69 (N = 2,064)	70-79 (N = 2,643)	80 + (N = 757)		
Total	100	34	66			38	49	14		
White	83	81	85	10.3	<.001	80	85	88	36.1	<.001
Married	51	74	39	549.7	<.001	61	49	30	214.5	<.001
Alone	41	22	51	419.4	<.001	31	43	60	201.3	<.001
Residence:										
Urban	58	54	60			52	61	64		
Semi-rural	22	23	21			25	21	18		
Rural	20	23	19	17.1	<.001	23	19	18	51.5	<.001
Health insurance:										
None	5	5	5			11	1	1		
Medicare	22	23	21			18	24	27		
Medi-Cal	13	11	14			11	13	14		
Medicare and HMO	6	6	6			5	7	6		
Other	55	55	55	9.7	<.05	56	55	51	334.9	<.001
Self-reported chronic conditions:										
Hypertension	24	21	26	12.3	<.001	23	25	25	3.7	NS
Arthritis	31	24	35	72.3	<.001	30	32	30	3.8	NS
Stroke	2	3	2	6.8	<.01	2	3	3	10.4	<.01
Cardiovascular	13	14	13	2.9	<.10	11	14	16	11.4	<.01
Diabetes	6	7	5	2.5	NS	6	5	6	1.2	NS
Respiratory	6	7	6	1.5	NS	6	6	5	0.8	NS
Vision	18	17	18	1.0	NS	15	18	24	28.6	<.001
Hearing	11	15	9	46.8	<.001	10	11	17	32.9	<.001
Number of chronic conditions:										
None	44	46	43			46	44	42		
One	23	22	24			24	23	22		
Two	17	17	18			17	18	16		
Three or more	16	15	16	5.0	NS	13	16	20	24.9	<.001
Hypertension:										
None	73	72	74			73	74	71		
Mild <sup>1</sup>	20	21	20			20	20	22		
Moderate <sup>2</sup>	6	6	5			6	6	6		
Severe <sup>3</sup>	1	1	1	2.6	NS	1	1	1	5.0	NS
Confined to bed (past month)	9	8	9	2.1	NS	9	9	7	3.0	NS
Saw physician (past year)	77	73	80	31.0	<.001	72	80	82	48.8	<.001
Hospitalized (past year)	12	13	11	2.8	<.10	9	13	16	33.3	<.001

<sup>1</sup>Either 160 < = systolic < = 179 or 90 < = diastolic < 99.  
<sup>2</sup>180 < = systolic < = 199 or 100 < = diastolic < = 109.

<sup>3</sup>Systolic > = 200 or diastolic > = 110.  
 NOTE: NS = not significant.

by the participant or assessed by the nurse, overweight, underweight, or unwanted weight loss or gain were marked as problems. State nutrition standards (6) were used to assess dietary status. An exercise problem was identified by a participant's complaints or by the nurse, based on related findings in the health assessment. Medication counseling involved determining the amount of medication taken per day and any side effects, evaluating ability to adhere to the medication regimen, and alerting the participant to warnings on the packages. Immunization counseling included checking for protection from tetanus, pneumonia, and influenza.

Smoking and alcohol abuse were examined only if a participant appeared to have symptoms of a

problem. Nurses assessed whether women regularly practiced monthly breast self-examinations and sought annual physical examinations with mammography. The final area of health counseling was the adequacy of medical supervision for any health problem.

Persons with positive findings were referred for intervention to district public health nurses, other health professionals, or other community resources. Counseling focused on self-help techniques, such as exercise, or maintaining a low sodium diet, and lifestyle modifications, such as smoking cessation or weight reduction.

In conducting our study we drew a simple 33 percent random sample from a population that

Table 2. Assessment and referrals of sample participants in three major health areas, California Preventive Health Care for the Aging Program, 1985-86

Area	Persons assessed		Health problem found		Referred to other professional		Referred to physician	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
<i>Organ systems</i>								
Vision .....	4,112	73	986	24	660	67	467	47
Hearing .....	3,645	65	626	17	384	61	182	29
Oral, dental .....	4,090	73	933	23	517	55	104	11
Gastro-intestinal .....	3,413	61	451	13	222	49	117	26
Blood pressure .....	5,200	92	1,357	26	738	54	432	32
Cardiovascular .....	3,564	63	466	13	302	65	202	43
Musculoskeletal .....	3,849	68	919	24	426	46	161	18
Skin .....	3,941	70	823	21	551	67	391	48
Respiratory .....	3,313	59	318	10	153	48	84	26
Genitourinary and gynecological ...	3,691	66	961	26	599	62	390	41
<i>Laboratory reports</i>								
Urinalysis .....	3,049	54	544	18	284	52	199	37
HGB/HCT .....	3,578	64	295	8	154	52	60	20
Blood sugar .....	3,686	65	555	15	338	61	198	36
<i>Health counseling</i>								
Weight control .....	4,733	84	765	16	308	40	30	12
Immunization .....	3,202	57	574	18	353	62	55	10
Medication .....	4,484	80	606	14	373	62	191	32
Smoking .....	2,921	52	255	9	96	38	5	2
Alcohol .....	2,908	52	97	3	39	40	4	4
Nutrition .....	4,515	80	1,337	30	897	67	34	3
Exercise .....	4,397	78	705	16	324	46	6	1
Psychosocial .....	5,637	100	837	15	317	38	33	4
Breast examination .....	2,435	43	359	15	270	75	36	10
Medical supervision .....	3,770	67	640	17	441	69	320	50

included all PHCAP participants seen in the program year 1985-86. If a participant had more than one visit that year, then the first visit was selected. The total sample size was 5,454. Data from actual case records were obtained from a statewide computerized database and analyzed using the SAS statistical package (9). The Pearson chi-square test for independence was used to test for significant differences between groups.

## Results

**Major characteristics.** About one-third (N=1,859) of the sample were men, and two-thirds were women (table 1). The majority were white, with less than 17 percent nonwhite. Close to half of our sample was married; a slightly smaller percentage lived alone (41 percent). Forty-nine percent of the total sample (2,643) was in the 70 to 79 year age category.

More than half (59 percent) of the PHCAP participants had private medical insurance in addition to Medicare. Women were somewhat more likely to be on Medicaid (Medi-Cal in California) than male participants. Age was significant ( $P < .001$ ) largely because younger elderly were more likely than older participants to have no

medical insurance whereas participants who were 70 years or older at least had Medicare. Medical insurance entitlement is also a proxy of participants' financial status; those elderly who were eligible for Medicaid (13 percent) and many of those who had no insurance (5 percent) were probably low-income elderly.

Compared to the male elderly, a somewhat larger proportion of female participants was white, not married, living alone in more urban areas, and of lower socioeconomic status. The gender differences in marital status ( $P < .001$ ) and living arrangements ( $P < .001$ ) were highly significant. Older PHCAP participants were more likely than younger participants to be white, not married, live alone, live in urban areas, and not be on welfare (Medicaid).

**Health status and use of medical care by sex and age.** Of the chronic diseases, only hypertension, arthritis, and hearing loss showed significant gender differences (table 1). More than half of the participants had at least one chronic condition at the time of visiting PHCAP sites. Thirteen percent of participants in their sixties had three or more chronic diseases, whereas one-fifth of the participants 80 years or older had three or more chronic health problems. Older persons reported having more

problems with stroke, cardiovascular symptoms, vision, and hearing. Women more often reported arthritis and hypertension, whereas men more often reported stroke and hearing problems. However, when comparing the degree of hypertension among the men and women, the differences were no longer significant.

One measure of health status was whether a PHCAP participant was confined to bed in the previous month because of illness. Only 9 percent of our sample reported this situation, with no significant age or gender differences.

Hospitalization and physician visits are additional health indicators that measure both health status and use of medical care. A majority of the sample (88 percent) had not been hospitalized in the preceding year and there was no gender difference in hospitalization rates. Older participants tended to be hospitalized more frequently and longer ( $P < .001$ ). Most of the hospitalizations were short term (6 days or less). Medical care use was also measured by whether a PHCAP participant had seen a physician in the previous year. About three-fourths of the sample had visited a physician in the past year. Women and very old participants tended to visit a physician more often.

Seventy-five percent of the participants had received at least one complete PHCAP screening during the year. Younger participants were more likely than older participants to receive complete screenings, but older participants made more visits. The average number of visits in program year 1985-86 was 2.5.

**Health areas assessed.** Table 2 reports the breadth of health screening activities within the various PHCAP sites. The number and percent reported under the column heading "persons assessed" indicate how many of the 5,454 participants were assessed by a PHCAP nurse for that specific health area. These data show that nurses used considerable discretion on whether a specific area was assessed for a given participant during the program year 1985-86. Although all participants could have been screened, seldom was this the case. Instead the nurses focused the assessment on selected areas.

The data reflect whether a specific area was examined by a PHCAP nurse for a given participant during program year 1985-86. The most commonly assessed areas in the health systems were blood pressure (92 percent), vision, and oral-dental (73 percent). The least frequently assessed health system was respiratory (59 percent). In health counseling, the most commonly assessed areas were

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psychosocial (100 percent) and weight control (84 percent). The least assessed area was breast examination counseling (43 percent) primarily because it was seldom given to male participants. Blood sugar and HGB/HCT testing were more often performed than urine testing. Generally, laboratory testing was less often administered than either health systems screening or health counseling.

**Problem detection and referrals.** Table 2 also summarizes health problems detected by health assessments and subsequent referrals to another health professional. The third and fourth columns in table 2 show the number and percent of assessed participants found to have the indicated problem. The last four columns report the number and percent of those with a problem who were referred to another health professional. More than a fourth (26 percent) of the participants assessed for blood pressure and for genitourinary and gynecological conditions were found to have a problem. Respiratory assessments detected a problem in only 10 percent of those examined.

Overall, 40 percent of the referrals were to physicians; the remaining referrals were to a variety of other health professionals including dentists, podiatrists, nutritionists, public health nurses, and social workers. The data form did not identify the other professionals and, therefore, further analysis was not possible.

Followup data were available describing the consequences of referrals made by PHCAP nurses. These data show that a large percentage of referrals for specific health problems resulted in a new diagnosis or treatment plan. For example, more than one-half of all referrals for medication or nutrition problems resulted in a new treatment plan being adopted. Referrals for skin problems were especially likely to cause both a new treatment plan (42 percent) and a new diagnosis (42 percent). The data suggest that the PHCAP nurses were effective at identifying previously undiagnosed conditions.

Table 3. Summary of health promotional activities in the California Preventive Health Care for the Aging Program, 1985-86 sample

Item	Total	Organ systems	Health counselling	Laboratory tests
Average number areas assessed per patient (means).....	15.6	6.9	6.9	1.8
Percent of sample with at least 1 problem.....	80	67	54	20
Percent referred to other health professional for at least 1 problem.....	61	47	35	11
Percent referred to physician for at least 1 problem.....	40	33	11	7

PHCAP referrals were also instrumental in developing new and more appropriate treatment plans for these health problems.

**Summary of health promotional activities.** Table 3 summarizes health promotional activities. An average of 6.9 organ systems and 6.9 health counseling areas per patient were assessed. During the year, an average of 1.8 of the three laboratory tests were given. Two-thirds of the PHCAP participants were found to have at least one problem in an organ system. Close to half of the participants with a problem were referred to another health professional as a result of a health system problem that was detected by a PHCAP nurse.

## Discussion

A typical PHCAP participant was white, female, between 70 to 79 years of age, and lived in an urban area. According to the 1986 California Census, the PHCAP participants represented the State's population fairly well, except in terms of ethnicity. California's elderly population (ages 65 or older) includes more than one-fourth who are nonwhite. PHCAP only served 17 percent nonwhite elderly, which suggests that minority elderly persons were underserved by the program. One reason for this may be that the white elderly were more knowledgeable and conscientious about their health and the available health resources (10). Minority elderly are also harder to reach and participate less in the programs from which PHCAP draws its participants.

Compared to the National Health Interview Survey population (7), PHCAP participants were more likely to be widowed and less likely to be married (55 percent versus 49 percent). Since marital status

usually correlates with living arrangement, and PHCAP elderly women tended to be widowed when they were older, most of them tended to live alone. The National Health Survey data show 30 percent of elderly living alone, whereas 41 percent of PHCAP participants lived alone (11).

Sex and age differences in the health status of the elderly have been topics of enduring interest to health researchers (12-14). Some studies have found that elderly women are healthier than elderly men and that the younger elderly are healthier than the older elderly (15,16). Lubben and associates (17) reported that elderly women were more apt than elderly men to comply with important health practices. Because participation in health promotion programs is voluntary, sex differences may be significantly different among a sample of elderly participants in a health promotion program from the aged population as a whole; that is, elderly females have reported more diagnoses and functional impairment than elderly males in the general population (13).

PHCAP data showed that gender played a significant role in physician visits, but it was not important in differentiating disability and hospitalization experience. In this study, although women reported more hypertension problems than men, actual blood pressure readings did not show any sex differences. Some caution in interpreting this self-reported data on chronic conditions is suggested by Mechanic (18), who indicates that much of the excess in self-reported chronic illness by women compared to men is partially a reflection of their life situation and how they respond to and define illness.

In summary, although this phase of the study did not examine the program's effectiveness in terms of health outcomes, PHCAP health promotional activities detected a large number of health problems and made numerous referrals to other health professionals, particularly physicians, resulting in new diagnosis and treatments. Many diseases showed differences by sex and an age-specific prevalence. These data show that a community-based, well-elderly screening program can be an important component in the total system of health care for the elderly. The findings of this study may be useful to health practitioners and policy makers working with the well elderly in preventive health care settings.

## References.....

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